

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



COURSE OUTLINE

ESCI 102 - INTRODUCTION TO ENVIRONMENTAL SCIENCE (Lab)

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SCHOOL OF SCIENCE, HEALTH, AND CRIMINAL JUSTICE

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- A. **TITLE:** Introduction to Environmental Science (Lab)
- B. **COURSE NUMBER:** ESCI 102
- C. **CREDIT HOURS:** (1)
- D. **WRITING INTENSIVE COURSE:** No
- E. **COURSE LENGTH:** 15 weeks
- F. **SEMESTER(S) OFFERED:** Both Fall and Spring
- G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
1 hour 50 minutes of lab per week
- H. **CATALOG DESCRIPTION:** This is a one-credit hour laboratory course to accompany ESCI 101 (but not required for ESCI 101). It is designed for those students who have had little or no background of Environmental Science and is intended to teach them basic knowledge of Environmental Science in the laboratory using simple laboratory exercises.
- I. **PRE-REQUISITES/CO-REQUISITES:** (List courses or indicate “none”)
a. Pre-requisite(s): ENGL 101(Expository Writing) OR ENGL 102 (Oral and Written Expression) OR an 80 grade on the Regents English Language Arts Examination
b. Co-requisite(s): None

J. GOALS (STUDENT LEARNING OUTCOMES):

By the end of this course, the student will be able to:

Course Student Learning Outcomes	Institutional Student Learning Outcomes
1. Perform laboratory procedures according to provided instructions, Record experimental data, Input data into applications created for laboratory exercises/experiments, Prepare graphs of experimental data, Interpret laboratory exercise/experiment data to support, refute, or be inconclusive of an exercise/experiment hypothesis	Professional Competence Communication
2. Identify the basic tenants of the scientific method and write a scientific method evaluation for laboratory exercises/ experiments	Professional Competence Critical Thinking

K. TEXTS: (If a text is used it should adhere to APA, MLA or ASA)

Introduction to Environmental Science (In house Lab Manual)

L. REFERENCES: (alternative textbooks, references, and resources for the course): None

M. EQUIPMENT: (university supplied equipment, i.e., technology enhanced classroom):
Appropriate laboratory materials and equipment

N. GRADING METHOD: A-F

O. MEASUREMENT CRITERIA/METHODS:

- Lab. Experiments and Reports
- Assignments
- Participation

P. DETAILED COURSE OUTLINE:

I. Safety and Conduct in the Lab

- A. Rules and Regulations to be followed in the lab.
- B. Laboratory policies
- C. Contents of the student locker and familiarizing students with equipment and apparatus

II. Scientific Method

- A. Science and the Scientific Method
- B. Statistical Analysis
- C. Accuracy and Precision
- D. Experiment on size variation in nature using leaves as an example

III. Writing a Lab Report

- A. Learning how to write a detailed lab report
- B. Title, background, hypothesis, materials, procedure, results, conclusion
- C. A simple exercise on how to write a lab report with given information
- IV. Identifying and Understanding Different Ecosystems**
 - A. Ecosystem and food webs
 - B. Terrestrial and aquatic ecosystems
 - C. Energy flow through ecosystems: Biotic and Abiotic Components
 - D. Biodiversity
- V. Stream Water Quality**
 - A. Physical and chemical parameters of stream water quality
 - B. Diversity index
 - C. Importance of dissolved oxygen, temperature, macroinvertebrates
 - D. Species diversity and relative percent
- VI. Analyzing Water Usage**
 - A. Water usage in USA from 1950 to present
 - B. Public supply, rural domestic and livestock, irrigation, thermoelectric power, other
 - C. Water conservation
 - D. Personal steps to conserve water
- VII. Measuring Permeability Rate**
 - A. Permeability and its importance in charging aquifers
 - B. Permeability of different materials
 - C. Measuring rate of permeability
- VIII. Cleaning up Oil Spills**
 - A. Historic oil spills and their effects
 - B. How can oil spills be prevented?
 - C. Using various materials to clean up oil spills in a lab set up
 - D. Effect of temperature on oil spill clean up
- IX. Chemical Weathering**
 - A. Chemical weathering in nature
 - B. Effects of several factors on weathering
 - C. Comparing weathering due to natural versus anthropogenic sources
- X. Acid Rain and Counteracting its Detrimental Effects**
 - A. Acids, Bases, pH
 - B. Acid rain and its effects
 - C. Anthropogenic causes of acid rain
 - D. How to prevent acid rain and counteract the detrimental effects
- XI. Changes in Sea Level**
 - A. Causes for rise in sea level
 - B. Historic changes in sea level
 - C. Effects of rise of sea level
- XII. Comparing CFLs and LEDs with normal light bulbs**
 - A. Energy and Power
 - B. Cost of using LED and CFL for a period of time
 - C. Compare cost with ordinary bulb
 - D. Comparing brightness versus energy consumption
 - E. Payback period of LEDs and CFLs

XIII. Comparing Vinegar with a Chemical Based Supermarket Cleaner

- A. Health effects of harmful industrial chemicals
- B. Safer alternatives
- C. Comparing cleaning properties of chemical versus household cleaners

XIV. Toxic gases in the Environment

- A. Anthropogenic Nitrogen Oxides
- B. Chlorine
- C. Health effects of toxic gases
- D. How chlorine can accidentally be produced at home and can be lethal

XV. Tour of a Sustainable Green Building

- A. Green Building
- B. Energy footprint of a building and LEED certification
- C. Green building in action at SUNY Canton featuring solar panels, geothermal energy, energy efficient windows